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TRADITIONAL MANAGEMENT OF TUBERCULOSIS IN OGUN STATE OF NIGERIA: THE PRACTICE AND ETHNOBOTANICAL SURVEY

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Abstract

An ethnobotanical survey was conducted on plants used traditionally for the management of tuberculosis in five local government areas of Ogun State, Nigeria, in a bid to document herbs used in the management of tuberculosis with the aim of identifying possible drug lead from the phytomedicine of these communities. A semi-structured questionnaire was used to obtain the required information on the use of herbal remedies for the management. A total of 50 respondents made up of herbalists (40.0%), herb sellers (52.0%) and traditional medicine practitioners (8.0%) were interviewed in the study. The dominant age of respondents was in the range of 21-40 years (72.0%). Duration of treatment of tuberculosis with herbs was between 2-12 weeks. A total of 36 plants belonging to 20 families were proffered for the management of tuberculosis. Eighty four percent (42%) of the 50 respondents interviewed said that their clients observed no side effects and that the herbs were either available in the forest or purchased from the markets. *Cola acumminata* (fruit), *Garcinia kola* (leaf), *Vitallaria parodoxa* (oil), *Costus afer* (stem), *Pycnanthus angolensis* (stem bark) and *Aframomum melegueta* (fruit) were the most frequently mentioned herbs. The ethnomedicines of the studied areas of Ogun State, Nigeria seem to have a high potential as a source of drug discovery of anti-tuberculosis. This is of utmost importance because people living with human immunodeficiency virus (HIV) are susceptible to tuberculosis.

Key words: Ethnobotany, Tuberculosis, Traditional Management, Ogun State, Medicinal Plants

Introduction

Tuberculosis (TB) is the world's leading cause of death from a single infectious disease, caused by the micro organism *Mycobacterium tuberculosis*. TB most commonly affects the lungs but also can involve any organ of the body. In the past it was referred to as "consumption" because without effective treatment, these patients often would waste away (Kumar and Clark, 2002). Epidemiological evidence indicates that one third of the world population is infected with the causative agent, eight million cases emerge annually and about 2 million people die from this disease (Gautam et al 2007). Recent data from WHO support these estimates with 8.8 million new cases and 1.6 million deaths (WHO, 2007).

The upsurge of TB cases has been noticed in developing countries and frequency of *M. tuberculosis* in Africa is very high (two million new cases per year) (WHO, 2003) and it is an off shoot of a variety of factors including; poor nutrition, overcrowding, lack of control measures, inadequately supervised treatment and the high cost of therapy. In Nigeria, like in most other developing countries, the tuberculosis situation has worsened over the past few years. The country was rated fifth in prevalence by WHO in its 2008 global report (WHO, 2008).

Individuals infected with human immunodeficiency virus (HIV), are very susceptible to tuberculosis and often develop this disease before other manifestations of AIDS become apparent (Girling, 1989). Control of the tuberculosis epidemic linked with HIV infection will depend largely on the adequate treatment of tuberculosis, and possibly on effective chemoprophylaxis, not just for HIV-infected persons but for the community as well (WHO/IUATLD, 1989). Tuberculosis therapy has been revolutionized and the present treatment regimes are based on multi-drug therapy usually with three or four drugs. However, the emergence and spread of drug resistance *M. tuberculosis*, especially multi drug resistant strain to standard TB drugs such as

isoniazid and rifampicin reduces the efficacy of current treatment regimes and threatens programs aimed at controlling TB (Sacchettini et al. 2008).

Ethnobotanical survey is an important step in the identification, selection and development of therapeutic agents for medicinal plants. The approach of retrieval of information on the folk use of plants often yields more potentially useful compounds than empirical approach (Carvalho et al, 1991; Berlin et al, 1994). Unfortunately, plant drug discovery has not been very successful, despite the historical importance (Craigg et al, 1997). This has been due to the fact that in ethnobotany and natural products chemistry, the modes of preparation and administration of herbal preparations are often crucial variables in determining efficacy in pharmacological evaluations (Levine, 1981; Lewis et al, 1998; Albers-Schonerg et al, 1997). In rural African communities with limited access to western health care facilities, ethnobotanical and ethnomedical alternatives are used in the management of health problems including tuberculosis and HIV/AIDS. Such alternative remedies have provided leads for the development of chemotherapeutic agents as practiced in western medicine (Phillipson, 1994).

In continuation of our studies of ethnobotany of Nigeria for documentation of useful plants and drug discovery efforts (Ajaiyeoba et al, 2003; Ajaiyeoba et al, 2004; Ajaiyeoba et al., 2006), the ethnobatanical survey and the ethnomedicine of 5 LGAs in Ogun State of Nigeria is presented.

Materials and method

Research methodology.

Study area

The study area comprised five Local Government Areas (LGAs): Sagamu, Ikenne, Ijebu -Ode, Ijebu East and Ijebu North located in Ogun State in south western Nigeria; it covers an area of approximately 16,762 square km with an estimated population of about 4,054,272. Ogun State borders Lagos State to the south, Oyo and Osun states to the North, Ondo State to the east and the republic of Benin to the west.

Informed consent

Traditional Medical Practitioners and Herbalists involved in the treatment of tuberculosis were located by looking out for their signposts and obtaining directions from their patrons in the villages. Of all those contacted, only 50 volunteered to give information. Informed consent was obtained orally from all participants made up of the TMPs, herbalists or herb sellers before commencement of the interview.

Administration of questionnaire

The use of semi-structured questionnaire and oral interview were adopted to obtain the relevant ethnomedicinal data. The questionnaires were administered by trained interviewers and in some cases, money for transportation was given to unwilling respondents. The questionnaire was divided into three sections. The first section sought to find out demographic information of the respondent, with question on religious affiliation, nationality (Nigerian or Non Nigerian), tribe, gender, professional affiliation, (TMP, herb seller or herbalist) duration of practice (years) to ascertain how long he/she has being practicing. The second part consist of open ended question about treatment of the disease such as previous treatment of tuberculosis by the respondent, frequency of contact with tuberculosis patient, mode of treatment employed, availability of plants for the various herbal remedies duration of treatment and presence or absence of side effect. The last part dealt only with the specific plant used for these treatments and the various parts used. Majority of the respondents were not literate, the questionnaire was translated and interpreted to them orally in the local language, and the investigators filled questionnaires after each interview. Samples of all the plants mentioned were collected directly from the TMP, herbalist and herb sellers; the voucher specimens for each sample were prepared and deposited at the herbarium department of Forest Research Institute of Nigeria, Ibadan (FRIN) for identification.

Results

Demography and practice

All 50 respondents are of Yoruba ethnicity and understand the language perfectly, the modal age group was 41- 60 years (72%), the male to female ratio of respondents was 1:1 (50%:50%), 40% of the participant interviewed were herbalists, and 52% were herb-sellers; while 8% were TMPs. Majority of the herb-sellers were

female while most of the herbalists were male. The survey shows that only 20% of respondents claim to treat tuberculosis on regular basis. In addition to herbs, 25% of the respondents use adjuncts such as divination/ incantation, animal part and even prayer to aids the cure of their patients, these are believed to boost the effect of the medicinal plant, this is especially common among the herbalists and the TMPs. The investigators learnt that a great percentage of respondent (60%), inherited their knowledge of herbal treatment from their ancestors, while 35% got their knowledge by undergoing formal training, the remaining 5% indicated that their knowledge is both from ancestral source and training. Most of the respondents affirmed that complete cure is achievable between 2– 12 weeks, as a matter of fact, about 32.5% claim to achieve cure in about 2 weeks, although some respondents refused to reveal how long it took to treat the disease.

Sources and use of plants

The entire survey of 50 respondents yielded 36 species of plants from about 20 Families (Table 1). All the plant mentioned were confirmed to be available while just 10% are not always available due to seasonal variations and other reasons, but most of the plants can be found in the forest, around the home and can also be bought from the market places. Plant and plant parts mentioned by the respondents are outlined in Table 1. *Cola acumminata* (fruit), *Garcinia kola* (leaf), *Vitellaria parodoxa* (oil), *Costus afer* (stem), *Pycnanthus angolensis* (stem bark) and *Aframomum melegueta* (fruit) were the most frequently mentioned herbs. The study revealed that leaves were the most popular parts used in preparing the herbal remedies. Different methods were employed in preparing and dispensing herbal remedies as shown in Table 1. The most common method of drug administration was by oral application of decoctions or infusions,

Discussions

The knowledge of the uses of plants, which is sometimes jealously guarded by their owners, is a tradition passed on from one generation to the other by word of mouth, the changes imposed by modern life on social structures and attitudes now seem too often the cause of the loss or rejection of such indigenous practices (Berlin et al, 1994). This may occur quite rapidly and result in the loss of relevant information and skills often patiently and painfully acquired by processes of trial and error carried out over the centuries. The need to document this knowledge and verify the claims before they go into extinction is one of the reasons for undertaking this research.

Findings of this survey revealed that a good number of the herbalists/TMPs/herb sellers in the research area do not treat or claim to treat tuberculosis; information concerning the treatment of tuberculosis could only be obtained from 50 respondents out of over 100 practitioner that reside in the area of study, out of this number only 20% (10) claim to treat tuberculosis on a regular basis. This is unusual and note worthy, since traditional practitioners usually claim to be able to treat any illness or disease.

In the course of the interview, it was observed that most of the Respondents, could not distinguish between the symptoms of tuberculosis and that of other diseases of the respiratory system such as bronchitis, common cough and asthma. Sometimes the same mode of treatment was prescribed. However, some of the respondents, alleged that the presence of blood in the sputum and gradual loss of weight as confirmatory for the diagnosis of tuberculosis, which is quite true.

The result showed that majority (>80%) of the herbalists/TMP/herb sellers claimed no occurrence of side effects following their use of the herbal remedies. The implies that the herbs are devoid of any undesirable effects when used or that the herbalists/TMP/herb sellers never took notice of such effects,

Another issue worthy of note is the average duration of treatment of tuberculosis using herbal remedy, which may be novel when compared to duration of treatment with chemotherapeutic agent. Treatment of tuberculosis by using anti TB requires 6-12 months while from the results obtained, no single duration of treatment of different respondents exceeds 12 weeks. Some of the challenges encountered in the course of carrying out this survey include: respondents were unwilling to give relevant information due to the fear of losing their major source of income, some could not distinguish between normal cough, asthma and tuberculosis.

Non experimental validation of anti-tuberculosis activity of these medicinal plants was done by the way of literature survey and it was found out that a number of this plant were been used for the treatment of tuberculosis in West Africa region and other part of the African continent generally (Burkill, 1985; Storey and Salem, 1997). Some of the plants revealed in this survey have also been cited in the ethnobotanical survey of other African countries for example *Costus afer* (Betti, 2004), *Aframomum melegueta*, *Garcinia cola* and *Vitellaria paradoxa* (Sanogo et al., 2006). *Garcinia cola* has also been found to particularly inhibit the growth of *M. tuberculosis*, (Tsukamura, 1985).

Table 1. Plants used for management of Tuberculosis

Botanical Name	Local Name	Family	Common name	Parts used	Recipe	Frequency
Abrus precatorious L.	Mensenmensen titan	Leguminoseae	Jequirity, crab eye	Seed	Decoction	2
Acanthus montanus (Nees) T.Anderson	Egele	Acanthaceae	False thistle	Leaf	Infusion	2
Aframomum melegueta (Roscoe) K.Schum.	Ata ire	Zingiberaceae	Alligator pepper	Fruit	Tincture	4
Alectra sessiliflora (Vahl) Kuntze var	Mensenmesen gogoro	Scrophulariaceae	----------	Leaf	Infusion	1
Allium cepa L	Alubosa	Liliaceae	Onion	Bulb		
Alstonia boonei De Wild	Awogba	Apocynaceae	Stool wood	Leaf	Decoction	1
				Bark	Maceration	1
Baphia nitida Lodd.	Irosun	Papillioiedeae	Cam wood	Bark	Infusion	3
Bryophyllum pinnatum (Lam.) Oken	Abamoda	Crassulaceae	Life plant	Leaf	Infusion	4
Citrus aurantifolia (Christm.) Swingle	Osan wewe	Rutaceae	Lime	Fruit	Infusion	1
Citrus medica L	Osan aganyin	Rutaceae	Citron	Fruit	Infusion	2
Clerodendrum capitatum (Willd.) Schum. & Thonn	Esinsin	Verbenaceae	----------	Leaf	Decoction	1
Cocos nucifera L.	Agbon	Arecaceae	Coconut tree	Husk	Decoction	3
Cola acuminata (P.Beauv.) Schott & Endl.	Obi	Sterculiaceae	Kola	Fruit	Infusion	3
Costus afer Ker Gawl.	Ireke omode	Costaceae	Bush cane	Stem	Decoction	3
				Leaf	Infusion	3
Cymbopogon citratus (DC.) Stapf	Kooko oba	Gramineae,	Lemon grass	Leaf	Infusion	2
Elaeis guineensis Jacq.	Epo pupa	Palmae	Oil palm	Oil	Soup	3
Ficus asperifolia *Miq*	Epin	Moraceae	Sand paper tree	Leaf	Maceration	2
Garcinia kola Heckel	Orogbo	Clusiaceae	Bitter	Leaf	Decoction	8
Gloriosa superb L.	Mora	Liliaceae	Climbing lily	Leaf	Decoction	1
Glyphea brevis	Atori	Tiliaceae		Leaf	Decoction	3
Hibiscus sabdariffa L	Isapa	Malvaceae	Sorrel	Leaf		1
Ipomoea batatas (L.) Lam.	Odunkun	Convolvulaceae	Sweet potato	Peeling	Maceration	1
Ipomoea involucrata P.Beauv	Ododo oko	Convolvulaceae	----------	Leaf	Infusion	1
Jateorhiza macrantha (Hook.f.) Exell & Mendonça	Nanunamu	Menispermaceae	----------	Leaf	Infusion	1

Lonchocarpus cyanescens (Schumach. & Thonn.) Benth.	Elu	Leguminosae, Papilionoideae	African indigo	Leaf	Infusion	2
Musa nana	Ogede omini	Musaceae	Banana	Leaf	Meal	1
Ocimum gratissimum L.	Efinrin	Labiatae	Tea bush	Leaf	Tincture	2
Psidium guajava L	Guaba	Myrtaceae	Guava	Bark	Maceration	2
Pycnanthus angolensis (Welw.) Warb.	Akomu	Myristicaceae	False nut meg	Bark	Maceration	3
Spondias mombin L.	Iyeye	Anacardiaceae	Hog plum tree	Leaf	Infusion	2
Thonningia sanguinea Vahl	Oriya ile		Ground pineapple	Fruit	Decoction	1
Vitellaria paradoxa C.F.Gaertn	Ori	Sapotaceae	Shea butter tree	Oil	Decoction	2
Zygotritonia bongensis (Pax) Mildbr	Baka	Iridaceae	----------	Bulb	Tincture	1

Conclusions

Herbal medicine has been used for centuries in rural areas by local healers, a number of substances used in modern medicine for the treatment of several diseases have originated from research on medicinal plants. This survey is a step towards evaluating Nigerian medicinal plants for anti-tuberculosis properties, we hope to scientifically justify the ethnomedical claim by the respondents and also provide possible drug leads for tuberculosis chemotherapy.

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